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PREPARATION OF LIME-SULPHUR SPRAY

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Lime-sulphur is the most important of the sulphur sprays tested so far. It is an efficient fungicide for certain diseases of plants and a good contact insecticide. This spray can be prepared by the user in several different ways, and in addition a good standard commercial product can be purchased in concentrated form from most dealers in spray materials in Florida.

Do not use copper containers in preparing lime-sulphur. Any quantity can be prepared by using the following formulae as units. Any strength can be obtained by varying the amount of water for diluting the solutions. A hydrometer used for testing the concentration of lime-sulphur should be owned by all growers who use this spray extensively.

HOME-BOILED LIME-SULPHUR, used primarily as a clean-up or dormant spray, is prepared by the following formula:

Rock lime (high grade)	20 pounds
Flour of sulphur	15 pounds
Water	50 gallons

Place the required amount of rock lime in a large iron kettle or boiler (a barrel or wooden tank if live steam is to be used) and add about five gallons of water. To this add the required amount of sifted sulphur in dry or paste form. Heat should be applied, such as an open fire or live steam, sufficiently to cause vigorous boiling for an hour. Enough water should be supplied to the mixture during the process to insure a careful and complete slaking of the lime and to keep it of a good boiling consistency. The solution is now ready for diluting to 50 gallons. It should be strained before use. This spray should not be used on foliage of any kind because it will burn it.

SELF-BOILED LIME-SULPHUR is a fungicidal spray recommended particularly for use on the foliage of peach trees. A satisfactory mixture is obtained by using rock lime, flour of sulphur and water in the following proportion:

Rock lime (high grade)	8 pounds
Flour of sulphur	8 pounds
Water	50 gallons

Place the rock lime in an iron or wooden container and add about two gallons of water. As soon as the lime begins to slake add the sifted sulphur and mix quickly with the slaking lime. Stir constantly while the slaking proceeds; if the mixture becomes too thick or dry, add small amounts of water but not enough to stop the boiling. When the lime is slaked, add enough water to cool the mixture. The best mixture is obtained when it is cooled immediately after slaking is completed. This prevents deterioration that otherwise might advance so far as to cause burning of tender foliage when used on the trees. After the mixture has cooled, dilute partially and strain. Then add enough water to make 50 gallons and the spray is ready for application. This spray should be applied in the form of a fine mist by machinery equipped with a good tank agitator which should be kept in motion while the spray is being applied.

DRY-MIXED LIME-SULPHUR is often used as a substitute for self-boiled lime-sulphur, especially when only a small amount of spraying is

to be done or if one is not equipped to prepare the other mixtures. The ingredients listed in the following formula can be mixed dry in large quantities and used in various amounts as desired:

Flour of sulphur	8 pounds
Hydrated lime (high grade)	4 pounds
Calcium caseinate	½ pound
Water	50 gallons

The proper amounts of the first three items should be thoroughly mixed in the powder form and then sifted. The mixed powders will keep indefinitely and can be used in various amounts as desired. Always use the mixed powder and water at the rate of 12½ pounds to 50 gallons of water. In preparing the spray add the water slowly, stirring the mixture until thoroughly wet and free from lumps. Then add it to the spray tank, containing half the required amount of water, start the agitator and add the remaining amount of water. It is then ready to apply. When a large amount of spraying is to be done with power sprayers it is convenient to prepare the mixture in the tank. Fill the spray tank half full of water, add the required amount of the mixed ingredients in powder form to the screen, and wash them into the tank with the inflowing water while the agitator is in motion. When the tank is filled, the mixture is ready to apply. If smaller amounts of spray are desired, reduce the amount of mixed powders and water proportionately. Thus, 4 gallons of spray is made by using 1 pound of the mixed powders and 4 gallons of water.

Skimmilk may be substituted in this formula at the rate of two quarts for each half pound of calcium caseinate. The recipe in this case would read

Flour of sulphur	8 pounds
Hydrated lime (high grade)	4 pounds
Skimmilk	2 quarts
Water	50 gallons

Weigh out the proper amounts of sulphur and lime and mix them dry. Wet them with small quantities of a mixture of 2 quarts of skimmilk and 2 quarts of water. Work into a thin paste and when free from all lumps add the remaining diluted milk and enough additional water to make it thin enough to strain easily. Strain into partially filled spray tank, add the required water, agitate, and the spray is ready for application.

COMMERCIAL LIME-SULPHUR can be obtained from most dealers in spray materials. It is sold in air-tight containers in concentrated form having a Baumé test of from 28° to 32° with directions for use on the container. The commercial product is usually cheap enough to be used economically and when properly diluted it is thoroughly reliable.

Dilution of lime-sulphur is done accurately with the use of a Baumé hydrometer made for this specific purpose. Every user of lime-sulphur should own and use one. Baumé hydrometers made for testing lime-sulphur can be secured through your local druggist or the Experiment Station at nominal cost.

The following table gives the number of quarts of lime-sulphur solution of different degrees (Baumé) concentration which must be added to water to make 50 gallons of spray of different strengths.

Hydrometer reading in degrees Baumé	Amt. Lime-Sulphur to 50 Gallons Water						
	Dormant Spray			Foliage Spray			
	1-8	1-10	1-15	1-30	1-40	1-50	1-60
36	20 qts.	16 qts.	11 qts.	6 qts.	4½ qts.	3½ qts.	3 qts.
35	20½ qts.	16½ qts.	11½ qts.	6 qts.	4½ qts.	3½ qts.	3 qts.
34	21½ qts.	17½ qts.	12 qts.	6 qts.	5 qts.	4 qts.	3 qts.
33	22 qts.	18 qts.	12½ qts.	6½ qts.	5 qts.	4 qts.	3½ qts.
32	23 qts.	19 qts.	13 qts.	6½ qts.	5 qts.	4 qts.	3½ qts.
31	24 qts.	20 qts.	14 qts.	7 qts.	5½ qts.	4½ qts.	3½ qts.
30	25½ qts.	21 qts.	14½ qts.	7½ qts.	5½ qts.	4½ qts.	4 qts.
29	27 qts.	22 qts.	15 qts.	8 qts.	6 qts.	5 qts.	4 qts.
28	28 qts.	23½ qts.	16 qts.	8½ qts.	6½ qts.	5 qts.	4½ qts.
27	29½ qts.	25½ qts.	17 qts.	9 qts.	7 qts.	5½ qts.	4½ qts.
26	31½ qts.	26½ qts.	18 qts.	9½ qts.	7½ qts.	5½ qts.	5 qts.
25	33 qts.	27½ qts.	19 qts.	10 qts.	7½ qts.	6 qts.	5 qts.